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(54) Title: SINGLE MOLECULE ARRAYS FOR GENETIC AND CHEMICAL ANALYSIS

(57) Abstract: Random arrays of single molecules are provided for carrying out large scale analyses, particularly of biomolecules, such as genomic DNA, cDNAs, proteins, and the like. In one aspect, arrays of the invention comprise concatemers of DNA fragments that are randomly disposed on a regular array of discrete spaced apart regions, such that substantially all such regions contain no more than a single concatemer. Preferably, such regions have areas substantially less than  $1 \mu\text{m}^2$  and have nearest neighbor distances that permit optical resolution of on the order of  $10^2$  single molecules per  $\text{cm}^2$ . Many analytical chemistries can be applied to random arrays of the invention, including sequencing by hybridization chemistries, sequencing by synthesis chemistries, SNP detection chemistries, and the like, to greatly expand the scale and potential applications of such techniques.

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US06/22895

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC: C12Q 1/68(2006.01);C12M 1/00(2006.01);1/36(2006.01);C07H 21/04(2006.01)

USPC: 435/6,174,283.1,287.2;536/23.1,24.3

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/6, 174, 283.1, 287.2; 536/23.1, 24.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EAST, GOOGLE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0012930 A1 (ROTHBERG et al) 31 January 2002 (31.01.2002) columns 7-14.	1-89
Y	US 6,316,229 B1 (LIZARDI et al) 13 November 2001 (13.11.2001) Fig. 30, columns 3-4, 32-38.	1-89
Y	WO 2004/076683 A2 (DRMANAC) 10 September 2004 (10.09.2004) pages 14-29, 53-56.	1-89

Further documents are listed in the continuation of Box C.

See patent family annex.

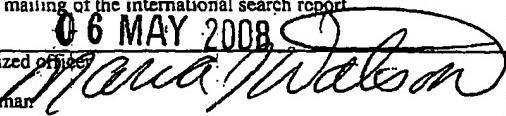
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"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

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